

***Lepra yunlingensis* and *L. taiwanensis* spp. nov. from China**

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ABSTRACT—Two new species of *Lepra* are described from China: *L. yunlingensis* is characterized by its 2-spored asci and the presence of norstictic and cryptostictic acids; *L. taiwanensis* is characterized by its 1-spored asci and the presence of barbatic acid.

KEY WORDS—lichenized fungi, *Pertusaria*, *Pertusariaceae*, *Pertusariales*, taxonomy

Introduction

Based on a combination of morphological and chemical characters, *Pertusaria* DC. was divided into three subgenera (Archer 1993). The earlier name *Lepra* Scop., rejected against the conserved *Pertusaria*, which could accommodate the species of *P.* subgen. *Monomurata* A.W. Archer (Archer 1993) or the “*Variolaria*”-group (Schmitt & Lumbsch 2004) of *Pertusaria* s.lat., was resurrected by Hafellner & Türk (2016). That circumscription of the genus *Lepra* is now accepted by other lichenologists (Lendemer & Harris 2017, Archer & Elix 2018, Ren 2019).

Lepra is characterized by its crustose thallus, disciform apothecia, 1–2 (–rarely 8)-spored asci, large hyaline ascospores, and the presence of a diversity of lichen substances, such as depsone, depsidones, β -orcinol m-depsides, β -orcinol p-depsides, fatty acids, and lichexanthone (Archer & Elix 2018).

In the course of reexamining *Lepra* specimens in KUN, two new species of *Lepra* were encountered that are described here.

Materials & methods

The specimens examined in this study were deposited in the Herbarium at Kunming Institute of Botany, Chinese Academy of Sciences, Yunnan, China (KUN).

Macromorphological characters were observed using a stereo microscope and micromorphological characters were examined by hand-cut sections under a light microscope. The lichen products were detected primarily by spot tests K = a aqueous solution of 10% potassium hydroxide (KOH), C = a saturated aqueous solution of calcium hypochlorite ($\text{Ca}(\text{ClO})_2$), KC = K solution followed by C] and thin-layer chromatography (TLC) with solvent systems A, B, and C (Elix 2014).

Taxonomy

Lepra yunlingensis Q. Ren, sp. nov.

FIG. 1

FN 570769

Differs from *Lepra wulingensis* by its 2-spored asci and the absence of psoromic acid.

TYPE: China. Yunnan, Nanjian County, Lingbaoshan National Park, 24.7700°N 100.4961°E, alt. 2355 m, on bark, 29 Jun. 2015, X. Ye 15-47837 & W.C. Wang (Holotype, KUN).

ETYMOLOGY: The epithet refers to the name of the type locality, the Yunling Mountains.

THALLUS corticolous, crustose, verrucose to verruculose, thin, grayish green; margin indistinct; prothallus not visible; isidia absent; soredia present, granular, restricted to the verrucae. VERRUCAE sorediate, numerous, crowded but rarely fused, c. 1.0 mm in diam. APOTHECIA 1 (less often 2–3) per verruca, with pinkish discs densely covered with white pruina. ASCOSPORES 2 per ascus, uniseriate longitudinally, hyaline, $57\text{--}97 \times 33\text{--}48 \mu\text{m}$; ascospore wall smooth. PYCNIDIA not observed.

CHEMISTRY: Medulla K+ yellow turning red, C–, KC–. Containing norstictic acid and cryptostictic acid.

REMARKS: Diagnostic characters for *L. yunlingensis* are a thin corticolous thallus, granular soredia restricted to verrucae, pinkish discs covered with white pruina, 2-spored asci, and the presence of norstictic and cryptostictic acids. Morphologically, the new species is very similar to *L. wulingensis* (Z.T. Zhao & Z.S. Sun) Q. Ren, which differs in its 8-spored asci and presence of psoromic acid (Ren & al. 2009, as *Pertusaria wulingensis*).

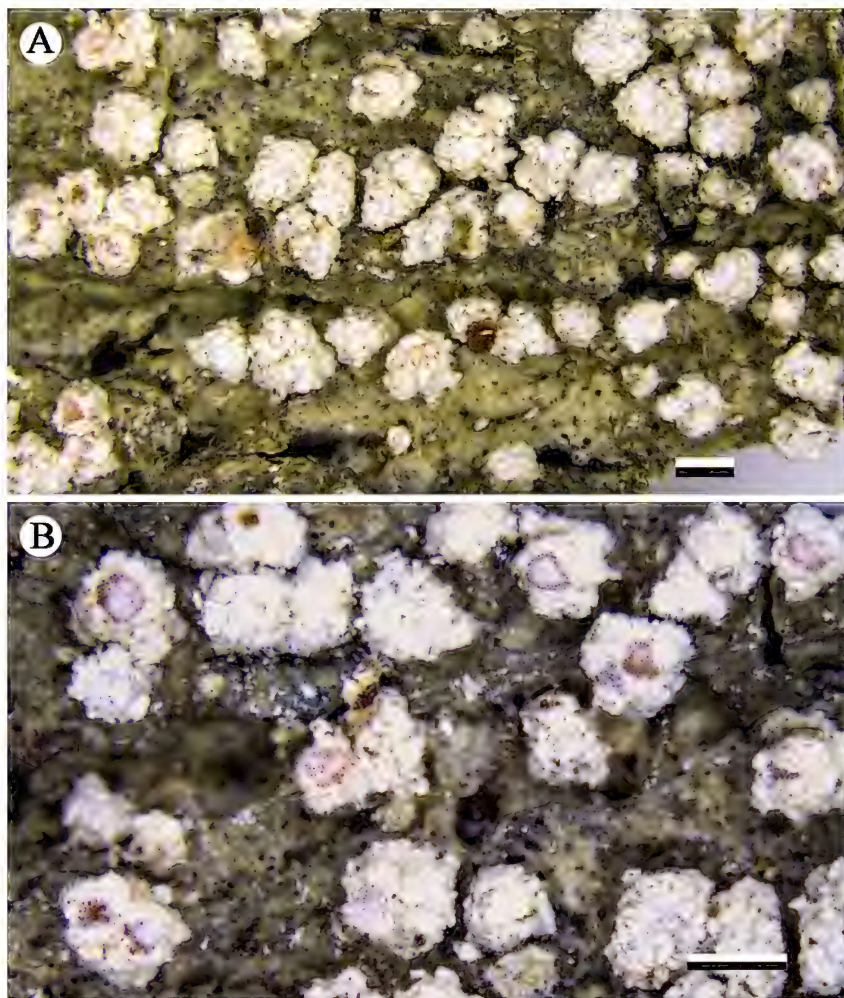


FIG. 1. *Lepra yunlingensis* (KUN – Ye 15-47837). A. Thallus with numerous verrucae. B. Detail of verrucae, showing disks covered with white pruina. Scale bars = 1 mm.

Lepra bambusetorum (Zahlbr.) Q. Ren, *L. composita* (Zahlbr.) Q. Ren, and *L. trachythallina* (Erichsen) Lendemer & R.C. Harris are three species known from China that produce disciform apothecia and 2-spored asci. However, they are separated from *L. yunlingensis* by the presence of different lichen substances:

salazinic acid in *L. bambusetorum*, protocetraric acid in *L. composita*, and thamnolic acid in *L. trachythallina* (Ren 2019).

***Lepra taiwanensis* Q. Ren, sp. nov.**

FIG. 2

FN 570770

Differs from *Lepra multipunctoides* by its pinkish discs and the absence of fumarprotocetraric acid.

TYPE: China. Taiwan, Nantou County, Mt. Hehuan, 24.1358°N 121.2872°E, alt. 3303 m, on bark of *Abies* sp., 23 Sep. 2015, L.S. Wang 15-49266 & X.Y. Wang (Holotype, KUN).

ETYMOLOGY: The epithet refers to the name of the type locality, Taiwan.

THALLUS corticolous, crustose, thin, whitish to grayish; prothallus distinct, whitish; isidia absent; soredia fine and restricted to the verrucae, white. VERRUCAE abundant, rounded in outline, 1–1.5 mm in diam., punctiform to hemispherical when young, pseudocyphella-like. APOTHECIA 1–4 per verruca, with pinkish discs densely covered with white pruina. ASCOSPORES 1 per ascus, usually immature, hyaline, ellipsoid, $70\text{--}205 \times 20\text{--}81\text{ }\mu\text{m}$; ascospore wall smooth, c. $13\text{ }\mu\text{m}$ thick. PYCNIDIA not observed.

CHEMISTRY: Medulla K–, C–, KC+ pink. Containing barbatic acid.

ADDITIONAL SPECIMEN EXAMINED—CHINA. TAIWAN, Nantou County, Mt. Hehuan, 24.1358°N 121.2872°E, alt. 3303 m, on *Abies* bark, 23 Sep. 2015, L.S. Wang 15-49219 & X.Y. Wang (KUN).

REMARKS: Diagnostic characters for *L. taiwanensis* are a thin whitish to grayish corticolous thallus, fine soredia restricted to verrucae, pinkish discs densely covered with white pruina, 1-spored asci, and the presence of barbatic acid. Morphologically, the new species resembles *L. multipunctoides* (Dibben) Lendemer & R.C. Harris and the abundantly collected species identified by Chinese lichenologists as *L. amara* (Ach.) Hafellner, but *L. multipunctoides* contains fumarprotocetraric acid and *L. amara* contains picrolichenic acid (Ren 2019).

Barbatic acid is also known from two other *Lepra* species: *L. barbatica* (A.W. Archer & Elix) I. Schmitt & al. and *L. wirthii* (Elix & A.W. Archer) I. Schmitt & al. *Lepra barbatica* is a sterile, isidiate species occurring in Eastern Australia and New Zealand (Archer 1997, Galloway 2007; as *Pertusaria barbatica*); *L. wirthii* has black discs and larger ascospores ($200\text{--}240 \times 56\text{--}70\text{ }\mu\text{m}$) and occurs in New Zealand (Archer & Elix 2013, as *Pertusaria wirthii*).

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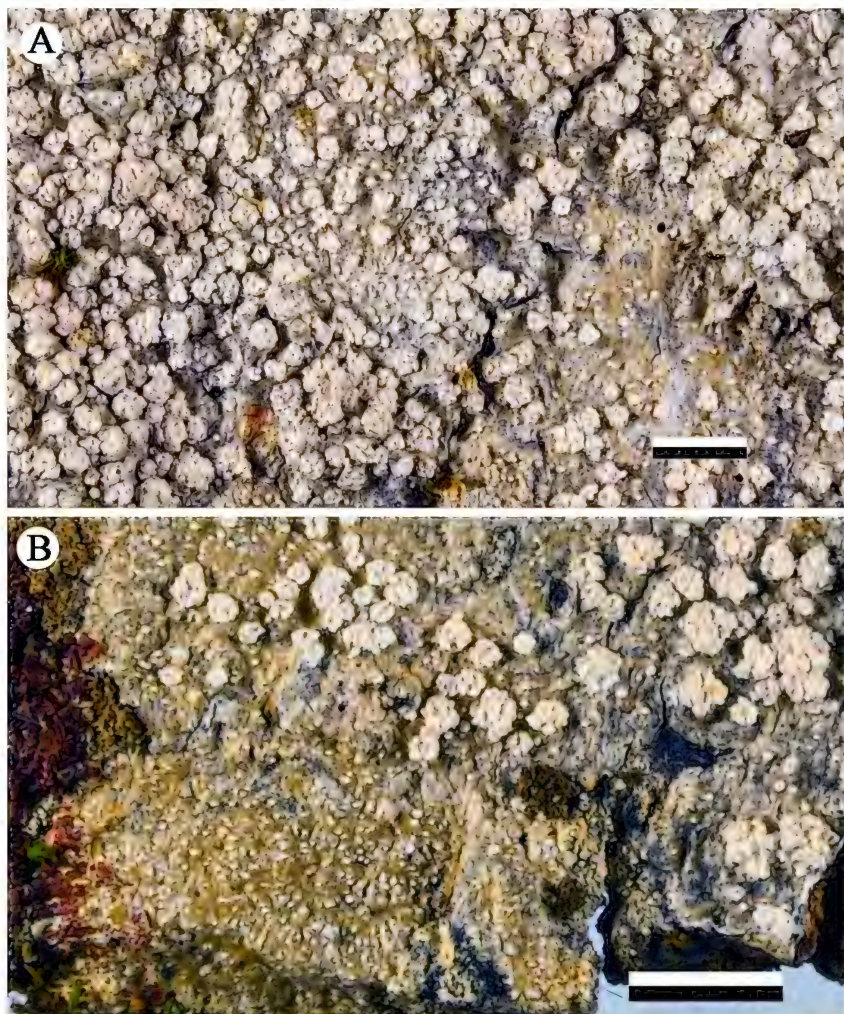


FIG. 1. *Lepra taiwanensis* (KUN – Wang 15-49266). A. Thallus with substratum, showing numerous verrucae. B. Young thallus with pseudocyphella-like verrucae. Scale bars = 5 mm.

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